

What is claimed is:

1. A head support device comprising a head, a support arm with said head disposed at one end thereof and an elastic member formed near the other end, and a
5 first base arm having a coupling portion projected at one end thereof,

wherein the end of said elastic member is fixed on said first base arm, and said support arm or said first base arm is provided with a vertical rotation supporting point.

- 10 2. A head support device comprising a head, a support arm with said head disposed at one end thereof and an elastic member formed near the other end, and a first base arm having a coupling portion projected at one end thereof,

wherein the end of said elastic member is fixed on said first base arm, and said support arm or said first base arm is provided with a vertical rotation supporting
15 point, and

a head is disposed on a surface opposing to the recording medium of said head slider, apart from the vertical rotation supporting point in the longitudinal direction of said support arm.

- 20 3. The head support device of claim 1, wherein said elastic member is formed in one-piece with said support arm along the longitudinal center line of said support arm close to the other end of said support arm at the opposite side of said head.

4. The head support device of claim 1, wherein said head is mounted on a
25 head slider, and said head slider is disposed at said one end of said support arm via a

flexure.

5. The head support device of claim 4, wherein a balancer is fitted on the other side of said support arm across said vertical rotation supporting point from said slider.

6. The head support device of claim 5, wherein when an external impact force is applied to said head slider, suppose the distance from the action point of load that activates said head slider toward the recording medium to the immovable point of said head slider rotated in the direction of pitch is L_o , and the length in the direction of air flow from the air inflow end to the air outflow end of said head slider is L_s , then $0.5 < L_o / L_s < 2$.

7. The head support device of claim 5, wherein when an external impact force is applied to said head slider, suppose the distance from the action point of load that activates said head slider toward the recording medium to the immovable point of said head slider rotated in the direction of pitch is L_o , the length in the direction of air flow from the air inflow end to the air outflow end of said head slider is L_s , the pitch angle of said head slider in a state of being afloat over the recording medium surface is θ_p , and the amount of floatation from the recording medium surface at the air outflow end of said head slider is X_t , then

$$1 \leq L_o / L_d \leq 2.5$$

where the surface opposing to recording medium is configured in that $L_d = (L_s / 2) + (X_t / \tan (\theta_p))$.

8. The head support device of claim 1, wherein said elastic member is symmetrical to the longitudinal center line of said support arm and is formed into a tongue-like shape provided with a U-shaped or V-shaped or \sqsupset -shaped through-hole in the peripheral portion thereof.

5

9. The head support device of claim 1, wherein said vertical rotation supporting point disposed on said support arm or said first base arm includes two pivots.

10

10. The head support device of claim 9, wherein the overall center of gravity, that is a total of the respective centers of gravity of head slider, flexure, said support arm, and said balancer, is positioned on a plane vertical to the recording medium including the line that connects the respective peaks of the two pivots for setting the mass, the center of gravity, and the fitting position of said balancer.

15

11. The head support device of claim 9, wherein the two pivots are disposed symmetrical about the longitudinal center line of said support arm.

12. The head support device of claim 1, wherein a side reinforcement is disposed at the longitudinal side of said support arm.

20

13. The head support device of claim 12, wherein said side reinforcement is formed by bending.

25

14. The head support device of claim 1, wherein there is provided a second

base arm having a hole for fastening to the coupling portion of said first base arm at one end thereof, a bearing portion, and a driving means at the other end.

15 15. The head support device of claim 6, wherein the immovable point is
obtained from the ratio of rotational rigidity of air layer generated between the
surface opposing to recording medium of said head slider and the recording medium
to rotational rigidity with respect to vertical displacement.

10 16. The head support device of claim 5, wherein a positive pressure generator
disposed on the surface opposing to recording medium comprises:

 a first positive pressure generator formed so as to be perpendicular to the
direction of air flow at a predetermined position from the air inflow end of said head
slider, and

15 a second positive pressure generator formed at a predetermined position from
an air outflow end at the widthwise center rectangular to the direction of air flow of
said head slider, and

20 a negative pressure generator is disposed in the middle of the first positive
pressure generator and the second positive pressure generator, which is formed so
that the center of negative force is positioned a little closer to the air outflow end
than to the action point of the negative force that activates said head slider toward
the recording medium.

25 17. The head support device of claim 16, wherein side rails are disposed on
either widthwise side of said head slider so as to be connected to the first positive
pressure generator.

18. The head support device of claim 16, wherein said negative pressure generator is disposed in an almost surrounded region at a middle stage that is lower than the surface of said positive pressure generator and higher than the surface of said negative pressure generator with reference to the surface of said positive pressure generator.

19. The head support device of claim 6, wherein the action point of negative force that activates said head slider toward the recording medium corresponds to the center of gravity of said head slider.

20. The head support device of claim 4, comprising a head slider holding portion which holds said head slider, and a head support arm having a support arm which holds the other end of said head slider.

21. The head support device of claim 6, wherein a suction toward the recording medium generated on the air lubricated surface of the head slider is greater than the equivalent mass of the head support device.

22. A disk drive, comprising:

a recording medium with a recording medium layer formed on the surface thereof;

a rotational driving means for rotating said recording medium; and

a head support device having a head slider mounted with a head at one end thereof, and with a driving means at the other end,

wherein said head support device comprises a support arm provided with a head at one end thereof and integrally formed with an elastic member along the longitudinal center close to the other end; a balancer fitted to the other end of said support arm; and a first base arm having a coupling portion projected at one end thereof, and the end of said elastic member is fixed on said first base arm, and said support arm or said first base arm is provided with a vertical rotation supporting point.

23. A disk drive, comprising:

a recording medium with a recording medium layer formed on the surface thereof;

a rotational driving means for rotating said recording medium; and

a head support device having a head slider mounted with a head at one end thereof, and with a driving means at the other end,

wherein said head support device comprises a support arm provided with a head at one end thereof and integrally formed with an elastic member along the longitudinal center close to the other end; a balancer fitted to the other end of said support arm; and a first base arm having a coupling portion projected at one end thereof, and the end of said elastic member is fixed on said first base arm, and said support arm or said first base arm is provided with a vertical rotation supporting point, and said head, opposing to the recording medium of said head slider, is disposed apart from the vertical rotation supporting point in the longitudinal direction of said support arm.

24. The head support device of claim 2, wherein said elastic member is

formed in one-piece with said support arm along the longitudinal center line of said support arm close to the other end of said support arm at the opposite side of said head.

5 25. The head support device of claim 2, wherein said head is mounted on a head slider, and said head slider is disposed at said one end of said support arm via a flexure.

10 26. The head support device of claim 2, wherein said elastic member is symmetrical to the longitudinal center line of said support arm and is formed into a tongue-like shape provided with a U-shaped or V-shaped or \sqsupset -shaped through-hole in the peripheral portion thereof.

15 27. The head support device of claim 2, wherein said vertical rotation supporting point disposed on said support arm or said first base arm includes two pivots.

20 28. The head support device of claim 2, wherein a side reinforcement is disposed at the longitudinal side of said support arm.

29. The head support device of claim 2, wherein there is provided a second base arm having a hole for fastening to the coupling portion of said first base arm at one end thereof, a bearing portion, and a driving means at the other end.

25 30. The head support device of claim 7, wherein the immovable point is

obtained from the ratio of rotational rigidity of air layer generated between the surface opposing to recording medium of said head slider and the recording medium to rotational rigidity with respect to vertical displacement.

5 31. The head support device of claim 17, wherein said negative pressure generator is disposed in an almost surrounded region at a middle stage that is lower than the surface of said positive pressure generator and higher than the surface of said negative pressure generator with reference to the surface of said positive pressure generator.

10

32. The head support device of claim 7, wherein a suction toward the recording medium generated on the air lubricated surface of the head slider is greater than the equivalent mass of the head support device.

15

20

25